

**REMARKS**

Claims 1-14 are pending in this application. Claims 6-13 stand withdrawn. The Office Action rejects claims 1-5 and 14 under 35 U.S.C. §103(a). Applicants respectfully traverse the rejections.

**I. Rejections under 35 U.S.C. §103(a)****A. Lampe-Onnerud**

Claims 1 and 14 are rejected under 35 U.S.C. §103(a) as having been obvious over Lampe-Onnerud (U.S. Patent Application Publication No. 2002/0192552). Applicants respectfully traverse the rejection.

Applicants respectfully submit that Lampe-Onnerud fails to teach or suggest all the features of independent claim 1. Specifically, Lampe-Onnerud at least fails to teach or suggest the presently recited composition  $\text{Li}_a\text{Ni}_b\text{Co}_c\text{Ba}_d\text{Al}_e\text{O}_x$  having the precise values for the variables a through x as are recited in claim 1. Instead, Lampe-Onnerud merely teaches a *very wide genus* of compounds that is so broad as to be incapable of suggesting any particular species of compound therein to a person having ordinary skill in the art.

Applicants have repeatedly argued throughout prosecution that the composition and ranges described in Lampe-Onnerud are too broad to support a prima facie case of obviousness. MPEP 2144.05 states "if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus." MPEP 2144.08 cites to *In re Baird*, 16 F.3d 380, 382 29 USPQ2d 1550, 1552 (Fed. Cir. 1994), which states "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does *not* by itself render that compound obvious" (emphasis added). Lampe-Onnerud's formula provides an extremely large number of possible distinct

compositions, and thus it would not have been obvious for a person skilled in the art to select Applicants' specific claimed compositions from Lampe-Onnerud's broad disclosure.

In response to this argument, the Office Action states (in its entirety): "Applicant is directed to Example 6." Office Action, page 6. However, as is admitted by the Office Action at pages 2-3, Example 6 of Lampe-Onnerud does *not* disclose a compound within the scope of the presently claimed invention. Instead, as the Office Action describes on page 3, the compound of Example 6 must allegedly be *substituted with two very specific compounds* and then *the weight ranges thereof varied*. Specifically, Mg and Mn in Example 6 must be exchanged for Ba and Al respectively, *and* even then the weight range of Ba must be varied from the 0.01 value taught by Lampe-Onnerud. Therefore, Applicant respectfully submits that the mere citation to Example 6 of Lampe-Onnerud does *not* refute Applicants' arguments regarding the very broad disclosure of Lampe-Onnerud.

Specifically, the Office Action also alleges that "four elements of A and seven elements of B are a small number of elements that one would envisage a combination of Al and Ba." Applicants respectfully traverse this allegation, on the grounds that this analysis does not take into account the full spectrum of compounds taught by Lampe-Onnerud. Lampe-Onnerud teaches that "A is *at least one* element selected from" four possibilities (emphasis added), and that "B is *at least one* element selected from" seven possibilities (emphasis added). See Lampe-Onnerud, Abstract. Therefore, the total number of combinations encompassed by this teaching is 1,905.

That the total number of species encompassed by Lampe-Onnerud's teaching is 1,905 can be understood as follows. Looking first at "A," the number of possible combinations for A is 15. Specifically, there are four combinations of one element, six combinations of two elements, four combinations of three elements and one combination of all four elements ( $4+6+4+1 = 15$ ). Turning now to B, the number of possible combinations is 127.

Specifically, there are seven combinations of one element, 21 combinations of two elements, 35 combinations of three elements, 35 combinations of four elements, 21 combinations of five elements, seven combinations of six elements, and one combination of six elements ( $7+21+35+35+21+7+1 = 127$ ). Therefore, the total number of combinations between A and B is  $15 * 127 = 1,905$ .

Therefore, Lampe-Onnerud does *not* teach "a small number of elements," as the Office Action alleges, but instead teaches nearly 2,000 possible combinations of elements. From these nearly 2,000 species taught by Lampe-Onnerud, the Office Action uses the present disclosure to select *one* very particular species, and alleges that a person of ordinary skill in the art would have envisaged this particular species. Applicant respectfully submits that this allegation has no basis in either the applied references or in the skill of a person having ordinary skill in the art. Instead, Lampe-Onnerud's teachings are "broad as to encompass a very large number of possible distinct compositions" just as in *In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005), discussed in MPEP 2144.05. Therefore, "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does *not* by itself render that compound obvious." Thus, *no* prima facie case of obviousness is made by the nearly 2,000 possible species taught by Lampe-Onnerud.

Furthermore, Applicants respectfully submit that, under MPEP 2144.05(III), "Applicants can rebut a prima facie case of obviousness based on overlapping ranges by showing the criticality of the claimed range. ... in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves *unexpected results* relative to the prior art range," (emphasis added). Although Applicants agree with the Office Action's statement that "the claimed ranges and the prior art ranges do not overlap" (Office Action, page 3), Applicants respectfully submit that a showing of criticality of the range still rebuts any allegation of obviousness, because such a showing of

criticality demonstrates the presently claimed compounds do *not* have the same properties as other species in the broad genus. Such a showing rebuts the Office Action's allegation that "one skilled in the art would have expected them to have the same properties."

Applicants respectfully submit that the presently claimed invention displays *unexpected results* of improved safety performance and discharge capacity. Specifically, for example, Comparative Example 3 of Table 2 of the present specification shows a composition wherein the value of "d" in the formula for the compound shown above is equal to 0.2. This composition is encompassed by Lampe-Onnerud's ranges but is outside Applicants' claimed range. Even though only the content of barium is outside the claimed range, appropriate thermal stability cannot be obtained and the discharge capacity is also degraded. Furthermore, Comparative Example 5 of Table 2 does not contain any barium (i.e. "d" = 0). In the absence of barium, the cycle performance, the safety performance and the discharge capacity all proved inferior to the claimed invention. Lampe-Onnerud nowhere teaches these specific unexpected results, and nowhere teaches or suggests that the elements and content amounts could or should be specifically selected to provide these beneficial results. Therefore, these unexpected results show that the presently claimed values for the variables "a" through "x" encompass a *critical range*, such that this range would not have been obvious over the much broader range of compounds taught by Lampe-Onnerud.

Accordingly, Lampe-Onnerud does not teach or suggest a positive electrode material for a lithium secondary battery according to the specifically selected compositions, as claimed in independent claim 1. Claim 14 depends from independent claim 1. Because Lampe-Onnerud fails to teach or suggest the features cited in independent claim 1, dependent claim 14 is patentable for at least the reasons claim 1 is patentable, as well as for the additional features it recites.

Reconsideration and withdrawal of the rejection are respectfully requested.

**B. Lampe-Onnerud in view of Lee**

Claims 2-5 are rejected under 35 U.S.C. §103(a) over Lampe-Onnerud in view of U.S. Patent Application Publication No. 2004/0076884 to Lee et al. ("Lee"). Applicants respectfully traverse the rejection.

The Office Action concedes that Lampe-Onnerud fails to disclose an amorphous material as required by claims 2-5. The Office Action asserts that Lee discloses coating a cathode material with  $\text{Al}_2\text{O}_3$ , and further asserts that it would have been obvious for one of ordinary skill in the art to substitute the coating disclosed by Lampe-Onnerud with the coating disclosed by Lee for the benefit of increasing the voltage and the capacity of the battery. *See* Office Action, page 5.

As discussed above, Lampe-Onnerud does not teach or suggest a composite oxide powder having a total composition represented by the formula of claim 1.

Lee, cited only against dependent claims 2-5, does not teach or suggest a composite oxide powder having a total composition represented by the formula of independent claim 1. Lee thus does not overcome the deficiencies of Lampe-Onnerud, as discussed above.

Furthermore, Applicants respectfully argued in the Amendment filed May 5, 2008, that there is no motivation to combine Lee with Lampe-Onnerud. The Office Action did not respond to this argument. *See* Office Action, pages 5-7. Applicants respectfully request that full consideration be given to these arguments, as reproduced below.

Applicants respectfully submit that there is no motivation to combine Lee with Lampe-Onnerud. Lee is directed to  $\text{LiCoO}_2$  cathode materials, whereas Lampe-Onnerud is directed to  $\text{LiNiO}_2$  materials. Lampe-Onnerud discusses the differences between the two types of materials, including that  $\text{LiNiO}_2$  materials are less safe than  $\text{LiCoO}_2$  materials. *See, e.g.,* paragraph [0003]. As discussed above, one of the key features taught by Lampe-

Onnerud is that the Co/Ni ratio of the coating material is greater than that of the core material, creating a gradient of diminishing Ni concentration from the core to the surface of each particle, giving a material that is safer, has a higher capacity, and demonstrates higher cyclability, than found in LiCoO<sub>2</sub> systems. Substituting the coating material of Lampe-Onnerud with the coating material of Lee would not create the gradient disclosed by Lampe-Onnerud (as there would be no Ni or Co in the coating). Also, none of the cited references teach or suggest that such a modification would produce the results Lampe-Onnerud was seeking to achieve and, in fact, the entire disclosure of Lampe-Onnerud indicates that the coating composition was critical to achieving the desired results. It is well-established that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959).

For at least the reasons discussed above, Lampe-Onnerud and Lee would not have rendered claims 2-5 obvious. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

## **II. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Notice of Appeal and Petition for Extension of Time

Date: February 5, 2009

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